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## AN ACCESSORY FOR A HAND DRILLING MACHINE

## TECHNICAL FIELD

The present invention relates to a device intended as an accessory for hand drilling machines for executing cleaning, polishing, finishing jobs and other jobs of a similar kind.

## BACKGROUND

Owners of and also other people living in private and small houses often themselves execute quite of lot of various maintenance jobs, both in regard of buildings and the gardens belonging to the houses. Then a need exists for different auxiliary means allowing them to easily and rapidly and at a reasonable cost execute such jobs.

Hand or portable drilling machines are often included in the set of tools of a house owner. They are often used as a driving source of various accessory tools and often have for this purpose a cylindrical attachment surface located near and around the output shaft of the machine. To the end of the output shaft which is most often provided with an external thread chucks and simple tools like brushes and grinding wheels can be directly attached. Housings or frames of larger tools are attached to the cylindrical attachment surface and a rotating part of such a large tool is coupled to the output shaft of the hand drilling machine. Examples of such larger tools include circular saws, compass saws and hedge pruners.

A polishing tool which is commercially available and is intended as an accessory for a hand drilling machine includes a roller having shaft journals, one of which is intended to be attached in the chuck of the drilling machine and the other one of which is rotatably mounted to a distant end of a bent part. The other end of the bent part has an opening to be attached around the cylindrical attachment surface of the machine. In use, the operator holds the machine with one hand and the other hand grips around the middle portion of the bent part.

## SUMMARY

It is an object of the invention to provide an accessory to a hand drilling machine by means of which various operations of the types rough cleaning, scraping, grinding, polishing, finishing etc. can be comfortably executed.

It is a further object of the invention to provide an

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accessory which can be easily changed to have a position at a distance of the driving machine.

An accessory is thus intended for a driving machine which as is common includes an output shaft and an attachment surface. The accessory includes a roller having a working surface and a coupling between the roller and the output shaft of the driving machine. The roller is at its two ends rotatably mounted in the outermost ends of a fork-shaped unit. This unit then includes a mounting part for attachment to the attachment surface of the driving machine, the mounting part encloses a coupling between the output shaft of the machine and a transmission. The transmission is provided in or at the fork-shaped unit for transferring the rotary movement from the machine, through the coupling, to the roller. A prolongation part can be inserted between the driving machine and the mounting part and has one end formed like the end of the driving machine which includes its output shaft and another end formed like the mounting part of the fork-shaped unit.

The accessory including the driving machine is suited for example the following jobs provided that a suitable working surface of the roller is used:

Brushing dark-coloured pressure-impregnated wood e.g. placed out-doors

Scraping/brushing house walls before repainting

Grinding floors indoors without requiring a large electrically driven special machine which can need stronger electrical fuses than provided in the house

Brushing stone surface e.g. outdoor to remove coatings of algae, moss

Polishing large surface like floors and boat sides

Cleaning boat bottoms and similar curved surfaces from algae and other coatings

Wiping of surfaces indoors and outdoors

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described as a non-limiting embodiment with reference to the accompanying drawings in which:

Figs. 1 and 2 are perspective views of an accessory for a hand drilling machine,

Fig. 3 is a sectional view of the accessory of Figs. 1 and 2,

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Fig. 4 is a sectional view of a prolongation rod and

Fig. 5 is a perspective view of an alternative embodiment of an accessory for a hand drilling machine.

#### DETAILED DESCRIPTION

5 Figs. 1 and 2 are perspective views of an accessory for a hand drilling machine. The accessory includes a mounting part 1 being essentially a short pipe and having an interior, cylindrical surface which is intended to be attached around an attachment surface 2, see the sectional view of Fig. 3, at the neck of a hand drilling machine indicated at 3. A tightening device 5 at the entrance of the mounting part 1 includes a knob 7 by which the tightening device and thereby the mounting part 1 can be rigidly attached to the chassis or frame of the drilling machine. To the cylindrical exterior surface of the mounting part 15 1 an operating handle 9 is attached through a bent part 11 and a ring 13, the ring passing around the mounting part. The bent part 11 and the ring 13 are secured to each other at a screw 15, so that the bent part can be turned around the screw 15 and thereby around the ring 13. Thereby also the handle 9 can be turned 20 around an axis perpendicular to the axis of the mounting part 1 and to the direction of the output shaft of the drilling machine.

The mounting part 1 continues into a transmission housing 17, the mounting part and the transmission housing forming one integrated part. The transmission housing 17 extends with a first 25 portion 19 perpendicularly to the axis of the mounting part 1 and then continues in a second portion 21 parallel to the same axis. From the first portion 19 extends, also perpendicularly to the same shaft but in a direction opposite this portion, a third portion 23 in or along which an angular part 25 can slide. The 30 angular part 25 includes an inner first portion 27 which mostly extends inside the third portion 23. A locking pin 29 passes through holes in the inner first portion of the angular part and in the third portion securing the angular part at a predetermined distance from the transmission housing 17. The angular part 25 35 also has a second outer portion 31 which projects perpendicularly from the first portion 27 and extends in parallel to the axis of the mounting part 1. The second outer portion 31 can be significantly thinner than the second portion 21 of the transmission housing and carries at its outermost end a screw 33

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The screw 33 carries one end of a rotatable and driven roller 35 and passes into a hole 37 in this end of the roller. The hole is concentrically to the shaft of the roller, see the sectional view of Fig. 3, and the screw carries a bearing 39 secured by a nut 40 and adapted to match the outer portion of the hole 37, the hole having a suitably located step. Through the fixed bearing 40 the roller 35 is rotatably mounted to the angular part 25. The other opposite end of the roller 35 has a contoured hole 41 in which a rotatable shaft 43 engages for driving the roller. The hole or recess 41 can for example have the shape of a deep, short groove and the output end of driving shaft 43 has complementary shape such as having a flat shape. The rotatable shaft 43 is rotatably mounted in the second portion 21 of the transmission housing 17 by bearings 45, 47 and carries and is rigidly connected to a toothed wheel 49. Around the toothed wheel 49 extends a toothed belt 51 which is driven by another toothed wheel 53. This toothed wheel 53 is rigidly attached to a shaft 55 which has a direction located exactly in aligned with the axis of the output shaft of the drilling machine 3. The shaft 55 is by bearings 57, 59 rotatably mounted in the transmissions housing 17. The shaft 55 has a free input end which is contoured in a suitable way, such as having a hexagonal cross-section. This input end is coupled to a short intermediate shaft 60 having an output end configured in a complementary way. For example it can have a hexagonal recess at its front or output end surface. The input end of the intermediate shaft 60 is coupled to the chuck 61 of the hand drilling machine for transferring the rotary movement of the output shaft of the drilling machine to the intermediate shaft 60 and therefrom to the shaft 55 in the transmission housing 17. The toothed belt 51 is deflected at the angle of the transmission housing 17 at the continuation between its first and second portions by intermediate wheels 63, 65 which freely rotate on a shaft 67.

as The roller 35 carries on its envelope surface a working material 69 as for example a cloth having e.g. polishing, grinding or scraping properties, such as an abrasive-coated cloth, abrasive paper, grinding nylon sheet. The working material 69 can also have brushing properties and then for example be

formed by short metal pins attached to a textile base. The working cloth 69 can be mounted on the roller by Velcro tapes, not shown. The working cloth can be applied as a strip helically wound around the envelope surface of the roller so that the edges of the strip are placed close to each other, the strip then having a Velcro tape at its inner surface opposite the abrasive surface and a mating Velcro tape being rigidly attached to the envelope surface of the roller.

The roller 35 is partly enclosed by a protective case 71 which corresponds to a portion of the surface of an imaginary cylinder including approximately sector-shaped portions of the end surfaces of the imaginary cylinder and including an envelope surface corresponding to a strip-shaped portion of the envelope surface of the cylinder. The protective case 71 has holes in its end portions at the axis of the corresponding imaginary cylinder and through these holes the screw 33 and the driving shaft 49 of the roller 43 respectively pass. The protective case 71 can, against the force from friction washers 72 placed at both sides of its end surface at the screw 33, be turned around the axis of the roller to give it a suitable position when using the accessory.

When using the accessory firstly suitable surface material 69 must be mounted on the roller 35. Then, the roller is detached by lifting the locking pin 29, whereupon the angular part 25 is pulled out along the rail 23. Thereby the roller 35 is released from the bearing 39 carried by the screw 33 and from the driving shaft 43. The surface material is mounted whereupon the roller 35 is mounted on the driving shaft 43 and the angular part 25 is pressed inwards, so that the bearing 39 is introduced into the hole 37 in the end of the roller. The hand drilling machine is coupled to the accessory by introducing the cylindrical mounting part 1 so that the intermediate shaft 60, which is secured in the chuck 61 of the hand drilling machine, by its output end engages with the input end of the input shaft 55. The screw 7 of the clamp 5 is then tightened. The operator then grips the handle 9 by one hand and around the drilling machine with the other hand, starts the machine and brings the roller 35 so that its surface coating 69 comes in contact with the surface to be worked.

By using a prolongation part 81, see Fig. 4, the hand

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drilling machine 3 can be placed at a larger distance of the rotating roller 35 and its fork-shaped holder formed by the transmission part 17 and the angular part 25. The prolongation part 81 has the shape of a pipe 83 having a front end configured to include an outer cylindrical attachment surface 85 in the same way as the attachment surface 2 of the drilling machine. The rear end is configured in the same way as the mounting part 1 of the tool unit as described above including a clamping device 5' and a tightening knob. Inside the pipe 83 a prolongation shaft 87 is provided which simply is an intermediate shaft like 60 but having a much greater length. Thus, at its front end it is configured to be capable of engaging with the input shaft 55 and at a rear end is configured to be firmly gripped by the chuck 61 of the drilling machine. The handle 9 including attachment devices can be configured so that it can be mounted on an arbitrary position on the pipe 83 for a comfortable operation of the driving machine including the mounted accessory.

The accessory can alternatively be configured to have the shaft of the drilling machine parallel to the axis of the roller 35 as is shown in the sectional view of Fig. 5. There, the mounting part 1" is located to have a side directly at the first portion 19" of the transmission housing 17" so that the axis of the mounting part extends in parallel to the longitudinal direction of the first portion and thereby parallel to the rotation axis of the roller. The driven input shaft 55" is located in the shaft direction of the mounting part and carries as above a toothed wheel 53" cooperating with a toothed belt 51". The toothed belt 51" is here located completely inside the second portion 21" of the transmission unit and extends directly, not requiring any intermediate wheels or deflection wheels, around toothed wheels 53" on the driven input shaft and 49 on the driving shaft 43 of the roller. However, the distribution of weight of the accessory including the mounted driving portable machine can in this embodiment be considerably more asymmetric than in the first embodiment described above due to the fact that the driving machine can project too much laterally. This fact also results in that the machine including the accessory cannot be used on surfaces close to walls. This embodiment is suitably provided with a handle, not shown, corresponding to the handle 9

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according to the above mounted using suitable clamping devices at a position corresponding to the position of the handle 9.

The working roller is in this embodiment shown as a brushing roller 35" which has bristles 35" attached to the envelope surface of the roller. This type of roller thus has a rigidly attached coating layer and the very roller body can have a somewhat smaller diameter adapted to the available space inside the protective cover. It can be used alternately with the roller 35 according to the above having a replaceable surface coating in the two embodiments of the accessory.

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